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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/664,094	09/19/2000	Masayuki Mizuno	Q60884	5281

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EXAMINER

MONDT, JOHANNES P

ART UNIT	PAPER NUMBER
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2826

DATE MAILED: 11/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/664,094

Applicant(s)

MIZUNO, MASAYUKI

Examiner

Johannes P Mondt

Art Unit

2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>8/8/3</u> | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

Response to Amendment

Amendment filed 8/8/3 forms the basis of this office action. In said Amendment Applicant substantially amended the claim language at least through substantial amendment of all independent claims, and further added new claims 10-12. Comments on Remarks in said Amendment are included below under "Response to Arguments".

Information Disclosure Statement

The examiner has considered the items listed in the Information Disclosure Statement filed 8/8/3 to the extent possible: item JP 61-174693 has not been considered, because no English abstract in original form is available to the examiner. Also, the only non-patent literature document cited in said Information Disclosure is not available to the examiner. Applicant is urged to make the English abstract of JP-61-174693 as well as said only non-patent literature document available to the examiner at the earliest possible time.

Response to Arguments

The amended claim language has been considered. With reference to the Interview Summary mailed 7/11/3 Examiner agrees with Applicant that the new claim language cannot be rejected on the basis of the same set of prior art references, and, furthermore, that the reason for the rejection under 35 U.S.C. 112 has been removed by

the said Amendment. However, a new search has found new grounds of rejections for the substantially amended claims 1-9 and found grounds for rejection of the newly added claims 10-12, as detailed below. Furthermore, new grounds for rejections under 35 U.S.C. 112, first paragraph, and 35 U.S.C. 112, second paragraph, have arisen due to the amendments to the claims.

Drawings

1. Figure 8 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. **Claim 3** is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim contains subject not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In particular, Applicant does not disclose how to select a size of said hole formed in said ground plate so as to decrease the AC coupling between said signal line and said another signal line

disposed close to said signal line and disposed on an opposite side of said ground plate: as delineated on page 10, lines 7-12, the size of the hole 24 in the ground plate as shown in Figure 2 is determined to reduce the AC coupling "as much as possible". However, in the case of the hole in said ground plate with close but oppositely positioned signal lines, the maximum reduction in AC coupling between the two signal lines is achieved in the limit when the size of said hole tends to zero. This follows from the inherent function of the ground plate as shield between two conductors when interposed between said two conductors, said inherency following from its constant potential irregardless of nearby charges; and hence, in the underlying claim, any choice of size of the hole compatible with the existence of said hole cannot possibly decrease said AC coupling.

3. **Claim 6** is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim contains subject not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In particular, Applicant does not disclose how to select a size of said hole formed in said ground plate so as to decrease the AC coupling between said signal line and said another signal line disposed close to said signal line and disposed on an opposite side of said ground plate: as delineated on page 10, lines 7-12, the size of the hole 24 in the ground plate as shown in Figure 2 is determined to reduce the AC coupling "as much as possible". However, in the case of the hole in said ground plate with close but oppositely

positioned signal lines, the maximum reduction in AC coupling between the two signal lines is achieved in the limit when the size of said hole tends to zero. This follows from the inherent function of the ground plate as shield between two conductors when interposed between said two conductors, said inherency following from its constant potential irregardless of nearby charges; and hence, in the underlying claim, any choice of size of the hole compatible with the existence of said hole cannot possibly decrease said AC coupling.

4. **Claim 12** is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim contains subject not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In particular, Applicant does not disclose how to select a size of said at least one through hole comprising a plurality of through holes formed in said ground plate so as to decrease the AC coupling between said signal line and said another signal line disposed close to said signal line and disposed on an opposite side of said ground plate: as delineated on page 10 of the Specification, lines 7-12, the size of the hole 24 in the ground plate as shown in Figure 2 is determined to reduce the AC coupling "as much as possible". However, in the case of the hole in said ground plate with close but oppositely positioned signal lines, the maximum reduction in AC coupling between the two signal lines is achieved in the limit when the size of said hole tends to zero. This follows from the inherent function of the ground plate as shield between two conductors when

interposed between said two conductors, said inherency following from its constant potential irregardless of nearby charges; and hence, in the underlying claim, any choice of size of the hole compatible with the existence of said hole cannot possibly decrease said AC coupling.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. The term "close" in the fifth line of **claim 1**, - thus also affecting **claim 9** through its dependence on claim 1, and the fourth line of **claims 10-11** is a relative term that renders the claim indefinite. The term "close" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

7. The term "small" in **claim 8** is a relative term that renders the claim indefinite. The term "small" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

8. A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent

protection desired. Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, **claim 9** recites the broad recitation of a signal line, a ground plate, another signal line and at least one through hole formed in said signal line as delineated in lines 3-7 of independent claim 1, while claim 9 also recites through the limitation in dependent claim 9 said signal line, said ground plate, said another signal line with "instead of said at least one hole in said signal line a plurality of holes" that may be in said ground plate, which is the narrower statement of the range/limitation. In particular, while an invention with said signal line, said ground plate, and said another signal line without any holes in said signal line but the plurality of slit holes in said ground plate would not meet claim 1, said invention would meet claim 9, from which it follows logically that claim 9 does not further limit claim 1.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. ***Claims 2, 4-5, 7 and 8*** are rejected under 35 U.S.C. 102(b) as being anticipated by Phelan (3,771,075).

On claim 2: Phelan teaches (cf. Figure 2):

a signal line 10 (cf. column 2, lines 37-49);

a ground plate 13 (cf. column 2, lines 37-49); and

another signal line 11 (cf. column 2, lines 37-49) close to said signal line and on an opposite side of said ground plate;

wherein at least one through hole 14 (cf. column 2, line 49) is formed in said ground plate; and an inner wall is only directly electrically connected to said signal line by virtue of being a slot, i.e., open space (cf. column 3, lines 15-20).

On claims 4 and 7: the shielding ability of the ground plate is minimally reduced for the selection, out of any given set of holes, of only one hole, hence the AC coupling for the number of holes taught by Phelan, namely: one (1) (cf. Figure 2, showing one through hole 14 in said ground plate 14 (cf. also column 2, line 50) reduces the AC coupling as claimed. Finally, a characteristic impedance of said transmission line is

increased by any hole, because the result of any hole in a transmission line is a reduction of capacitance (because less main surface area available) and an increase in inductance (because charge carriers are further hampered in their ability to quickly respond to any imposed electric field, said charge carriers having to circumnavigate the hole area), and hence the characteristic impedance defined by $\sqrt{L/C}$ is necessarily increased as a result of said any hole.

On claim 5: Phelan teaches (cf. Figure 2):

a signal line 10 (cf. column 2, lines 37-49);

a ground plate 13 (cf. column 2, lines 37-49); and

another signal line 11 (cf. column 2, lines 37-49) close to said signal line and on an opposite side of said ground plate;

wherein at least one through hole is formed in said signal line, i.e., conductive strips 15 constituting the signal lines 10 and 11 (cf. column 2, line 52) both being con-tiguous, hence showing a through hole, and an inner wall of said through hole formed in said signal line is only directly electrically connected to said signal line by virtue of being an interruption of conductive matter; and

wherein at least one through hole 14 (cf. column 2, line 49) is formed in said ground plate; and an inner wall is only directly electrically connected to said signal line by virtue of being a slot, i.e., open space (cf. column 3, lines 15-20).

Finally still with regard to claim 5, a characteristic impedance of said transmission line is increased by any hole, because the result of any hole in a transmission line is a reduction of capacitance (because less main surface area available) and an increase in

inductance (because charge carriers are further hampered in their ability to quickly respond to any imposed electric field, said charge carriers having to circumnavigate the hole area), and hence the characteristic impedance defined by $\sqrt{L/C}$ is necessarily increased as a result said any hole.

On claim 8: said at least one through hole in said ground plate is made small and this smallness reduces the AC coupling with the signal line being formed at a position where said another signal line is disposed. Furthermore, the adjective "small" renders the content of this claim indefinite, "smallness" being a matter of degree not delineated by the specification to such a degree as to give it a definite meaning for those of ordinary skills in the art (see 35 U.S.C. 112, second paragraph, rejection above).

Double Patenting

3. **Claim 11** is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 10. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. **Claim 1** rejected under 35 U.S.C. 103(a) as being unpatentable over Steensma (3,925,740) in view of MacDonald (5,633,613).

Steensma teaches a semiconductor integrated circuit comprising a microstrip structure (cf. title and abstract), comprising: a signal line 3/8 (cf. column 1, line 67 and column 2, line 9), and a ground plate 2 (cf. column 1, line 66), wherein at least one through hole 7 (cf. column 2, line 6) is formed in said signal line, and an inner wall of said through hole is only directly electrically connected to said signal line by virtue of the non-conductive nature of a hole (otherwise there would not be a hole but merely a change in the electrical conductivity).

Steensma does not teach the further limitation of "another signal line disposed close to the signal line and on an opposite side of said ground plate".

However, it would have been obvious to include said further limitation, because in the art of impedance tuning, i.e., the art of Steensma (cf. col. 1, lines 5-15), the application of two transmission lines on opposite sides of a ground plane has long been recognized as a means to utilize the ground plane as an electrostatic shielding means, *as witnessed for instance by MacDonald*, who teaches signal lines 30 and 32 on opposite sides of ground plate 34 (cf. column 3, line 11 –column 4, line 30).

Motivation, for inclusion of the teaching by MacDonald in the invention by Steensma, stems from the added control on impedance of the transmission line (cf. abstract in MacDonald), which would have been an obvious improvement over the

method by Steensma to tune the impedance of the transmission line (cf. column 1, lines 12-23).

Combination of said teaching with said invention is easily achieved through adding another transmission line on the opposite side of the ground plate in Steensma.

3. **Claims 1 and 10-11** are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsui et al (6,144,268) in view of MacDonald (5,633,613).

On claim 1: Matsui et al teach (cf. Figure 1) a signal line 3 (cf. col. 5, l. 11), a ground plate 2 (cf. col. 5, line 9) wherein at least one through hole 4 (cf. col. 5, line 13) is formed in said signal line, and an inner wall of said through hole 4 is only directly electrically connected to said signal line by virtue of being filled with an insulating material (a void being inherent in a gap within a conductive material, because otherwise the conductive material would not possess a gap).

Matsui et al do not necessarily teach the further limitation that another signal line is disposed close to the signal line and on an opposite side of said ground plate.

However, it would have been obvious to include said further limitation, because in the art of changing the impedance of transmission lines, i.,e., the art of Matsui et al (cf. col. 1, lines 50-53; keep in mind that reducing conductor losses is equivalent to rotating the impedance in the complex plane), the application of two transmission lines on opposite sides of a ground plane has long been recognized as a means to utilize the ground plane as an electrostatic shielding means, *as witnessed for instance by MacDonald*, who teaches signal lines 30 and 32 on opposite sides of ground plate 34 (cf. column 3, line 11 –column 4, line 30).

Motivation, for inclusion of the teaching by MacDonald in the invention by Matsui et al, stems from the added control on impedance of the transmission line (cf. abstract in MacDonald) and thus on conduction losses, which would have been an obvious improvement over the method by Matsui to modify the impedance of the transmission line (cf. column 1, lines 50-53).

Combination of said teaching with said invention is easily achieved through adding another transmission line on the opposite side of the ground plate in Matsui et al.

On claims 10 and 11 (identical, one of these claims, i.e., claim 11 constitutes double patenting, see "Double Patenting"): Matsui et al teach (cf. Figure 1) a signal line 3 (cf. col. 5, l. 11), a ground plate 2 (cf. col. 5, line 9) wherein a plurality of through holes 4 (cf. col. 5, line 13) is formed in said signal line (Applicant, by stretch of language, implies in the claim language that said plurality may be thought of as contained in one through hole; but in no way does the disclosed plurality of holes distinguish over the one in the cited prior art in this respect), and an inner wall of said through hole 4 is only directly electrically connected to said signal line by virtue of being filled with an insulating material (a void being inherent in a gap within a conductive material, because otherwise the conductive material would not possess a gap).

Matsui et al do not necessarily teach the further limitation that another signal line is disposed close to the signal line and on an opposite side of said ground plate.

However, it would have been obvious to include said further limitation, because in the art of changing the impedance of transmission lines, i.e., the art of Matsui et al (cf. col. 1, lines 50-53; keep in mind that reducing conductor losses is equivalent to

rotating the impedance in the complex plane), the application of two transmission lines on opposite sides of a ground plane has long been recognized as a means to utilize the ground plane as an electrostatic shielding means, *as witnessed for instance by MacDonald*, who teaches signal lines 30 and 32 on opposite sides of ground plate 34 (cf. column 3, line 11 –column 4, line 30).

Motivation, for inclusion of the teaching by MacDonald in the invention by Matsui et al, stems from the added control on impedance of the transmission line (cf. abstract in MacDonald) and thus on conduction losses, which would have been an obvious improvement over the method by Matsui to modify the impedance of the transmission line (cf. column 1, lines 50-53).

Combination of said teaching with said invention is easily achieved through adding another transmission line on the opposite side of the ground plate in Matsui et al.

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Johannes P Mondt whose telephone number is 703-306-0531. The examiner can normally be reached on 8:00 - 18:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J Flynn can be reached on 703-308-6601. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

NOTED & REPTD
SUPERVISOR PATENT EXAMINER
TECHNOLOGY CENTER 2826

JPM
October 31, 2003